CHARNOCK INITIAL REGIONAL RESPONSE ACTIVITIES (CIRRA)
Charnock Sub-Basin; Los Angeles, California

CIRRA Task 4
Source Water Assessment Report
(DHS Policy 97-005, Task 1)

Submitted to:

California Regional Water Quality Control Board,
Los Angeles Region

U.S. Environmental Protection Agency,
Region IX

On behalf of:

Shell Oil Company
Shell Oil Products Company
Equilon Enterprises LLC

Prepared by:

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C O N T E N T S

C O N T E N T S
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T A B L E S

F I G U R E S

C O N T E N T S
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A T T A C H M E N T S

ACRONYMS AND ABBREVIATIONS

1,2-DCA	1,2-Dichloroethane
1,1-DCE	1,1-Dichloroethene
AMSL	Above Mean Sea Level
bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAFMO	California Fire Marshall's Office
CDMG	Californian Division of Mines and Geology
CDOG	California Department of Oil and Gas
CDWR	California Department of Water Resources
Chevron	Chevron Products Company
COSM	City of Santa Monica
CERCLIS	Comprehensive environmental Response, Compensation and Liability Information System
DHS	Department of Health Services
DTSC	Department of Toxic Substances Control
DWSAP	Drinking Water Source Assessment and Protection Program
EDR	Environmental Data Resources, Inc.
ERNS	Emergency Response Notification System
Exxon	Exxon Company, USA
ft	Feet
ft/day	feet per day (unit of measure of hydraulic conductivity)
Geomatrix	Geomatrix Consultants, Inc.
gpm	gallons per minute
GVI	Ground Water Vulnerability Index
ID	identification number
in/yr	inches per year (unit of measure for areal recharge)
kg	kilogram
km	kilometer
Komex	Komex • H2O Science
LA	Los Angeles
LNAPL	Light NAPL
LUST	Leaking Underground Storage Tank
m	meter
MAP ID#	Identification No. by EDR for each site
mg	milligram
mg/L	microgram/Liter
msl	mean sea level
Mobil	Mobil Business Resources Corporation
MTBE	methyl tertiary-butyl ether
MW	monitoring well
NAPL	Non-Aqueous Phase Liquid
NPL	National Priority List
PAH	Polyaromatic Hydrocarbon

A C R O N Y M S AND A B B R E V I A T I O N S
(continued)

PBE	Physical Barrier Effectiveness (DWSAP)
PCE	Tetrachloroethylene
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RWQCB	California Regional Water Quality Control Board, Los Angeles Region
SA	Shallow Aquifer
SCWC	Southern California Water Company
SITE ID#	Unique Identifier Assignment to an Address by ENVIRON
SVE	soil vapor extraction
SWAR	Source Water Assessment
TCE	Trichlroethylene
TPHg	Total Petroleum Hydrocarbons as Gasoline
TRIS	Toxic Release Inventory System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank
VEW	vapor extraction well
VOC	volatile organic compound

1.0 INTRODUCTION

This Source Water Assessment Report is submitted in partial fulfillment of Task 4 of the *Scope of Work (SOW) for Initial Regional Response Activities to Address MTBE and Other Gasoline Constituent Contamination in the Charnock Sub-Basin*. This report has been prepared to comply with Task 1 of the Policy Memorandum 97-005 for the Direct Domestic Use of Extremely Impaired Sources of Drinking Water, issued by the California Department of Health Services (DHS) on November 5, 1997 ("DHS Policy 97-005"). The DHS Policy 97-005 guidance document outlines the general conditions and process that may need to be considered to receive a permit to use an extremely impaired drinking water source for domestic supply.

The SOW defines the "Charnock Well Fields" or "the Well Fields" as the (see Figure 1-1):

(1) drinking water supply wells previously operated by the City of Santa Monica (COSM) at 11375 Westminster Avenue, Los Angeles, and

(2) the drinking water supply wells previously operated by the Southern California Water Company (SCWC) at 11607 and 11615 Charnock Road, Los Angeles.

The COSM Well Field began operation in 1924 and the SCWC Well Field in 1928. The two Charnock Well Fields operated more or less continuously until June (COSM) and October (SCWC) of 1996, when further pumpage was discontinued due to increasing concentrations of methyl tertiary butyl ether (MTBE). The source of the MTBE appears to be related to releases from a number of service stations in the vicinity of the Well Fields.

The DHS Policy 97-005 memo outlines the general conditions, which define "an extremely impaired source", and a 10-step process that may need to be considered to use an extremely impaired drinking water source for domestic supply. This report has been prepared to comply with Step 1 of the processes detailed in the memo. This SWARR is primarily based on the DHS Policy 97-005 and the following:

- Drinking Water Source Assessment and Protection (DWSAP) Program (Revised April 1999), California Department of Health Services (DHS);

- Documents presented in References; and
- Conceptual Flow and Transport Model Report, Charnock Sub-Basin, Los Angeles, California, Task 9 Charnock Initial Regional Response Activities (CIRRA), ENVIRON, August 17, 2000.

A DHS Worksheet from the DWSAP has been completed and included in Attachment A. This report relies on data collected through December 2000.

1.1 Background

Although the COSM Well Field (Figure 1-2) has had a total of 19 production wells, only the following five have operated during the past decade (Table 1-1):

- CH-13,
- CH-15,
- CH-16,
- CH-18, and
- CH-19.

For the SCWC Well Field (Figure 1-3), only the following three wells were operated during the last decade (Table 1-2):

- SCWC 8,
- SCWC 9, and
- SCWC10.

During 1988 to 1996, an average of about 6,128 acre ft/yr (3,830 gpm) of ground water were extracted from the COSM Well Field, and about 120 acre ft/yr (75 gpm) were extracted from the SCWC Well Field.

USEPA has identified the following 12 Potential Responsible Party (PRP) sites for the contamination of water drawn into the Charnock Well Fields:

PRP Site No. 1	Responsible Party:
Super Petrol Fuels Former Exxon #7-9477 11284 Venice Boulevard Culver City, CA	Exxon

PRP Site No. 4
AM/PM
Arco #1246
11181 Washington Boulevard
Culver City, CA

Responsible Party:
Arco

PRP Site No. 5
Chevron #9-2894
11197 Washington Place
Culver City, CA

Responsible Party:
Chevron

PRP Site No. 6
Former Conoco/Kayo/Douglas
11198 Washington Place
Culver City, CA

Responsible Parties:
Conoco, Kayo, Douglas

PRP Site No. 7
Former Unocal #3016
11203 Washington Place
Culver City, CA

Responsible Party:
Unocal

PRP Site No. 8
Mobil #11-FX-5
3800 Sepulveda Boulevard
Culver City, CA

Responsible Party:
Mobil

PRP Site No. 10
3775 Sepulveda Boulevard
Los Angeles, CA

Responsible Party:
Chevron

PRP Site No. 11
Shell
3801 Sepulveda Boulevard
Culver City, CA

Responsible Party
Shell

PRP Site No. 12
Winall Oil #18.
10646 Venice Boulevard
Los Angeles, CA

Responsible Party
Winall Oil Co.

PRP Site No. 16
Tosco
Unocal #4357
11280 National Boulevard
Los Angeles, CA

Responsible Party
Tosco

PRP Site No. 23
Thrifty Oil #247
Former Chevron #9-0392
3505 Sepulveda Boulevard
Los Angeles

Responsible Parties:
Thrifty, Chevron

PRP Site No. 30
Great West Car Wash
11166 Venice Boulevard
Los Angeles, CA

Responsible Parties:
Kazuho Nishida, HLW

These 12 PRP sites are shown on Figure 1-1. ENVIRON International Corporation (ENVIRON) evaluated the available information presented in References for 11 service stations in the vicinity of the Well Fields, 10 of which are also on the 12 site list of PRPs identified by USEPA. . The two PRP sites not evaluated by ENVIRON are:

PRP Site No. 5
Chevron #9-2894
11197 Washington Place
Culver City, CA

Responsible Party:
Chevron

PRP Site No. 16
Tosco
Unocal #4357
11280 National Boulevard
Los Angeles, CA

Responsible Party
Tosco

The 11 sites evaluated by ENVIRON were grouped into four areas (Figure 1-1).

- Sepulveda/Palms Boulevard area (about 0.2 miles east of COSM Well Field) including:

  Thrifty No. 247
  Unocal 2726.

- Sepulveda/Venice Boulevard area (about 0.5 miles south–southeast of COSM Well Field) including:

  Great West Car Wash
  Mobil 18-FX6
  Chevron 9-0561
  Shell
  Exxon 7-9477.

- Sepulveda/Washington Boulevard area (about 0.85 miles south of COSM Well Field)

  Arco 1246
  Unocal 3916
  Conoco

- Venice/Overland Avenue area (about 0.9 miles southeast of COSM Well Field)

  Winall Oil 18

Except for Unocal 2726 in the Sepulveda/Palms area, the remaining ten service stations are from the 12 PRP site list. According to that evaluation, at each of the eleven service stations mentioned above:

- there has been evidence of fuel release;
- MTBE has been detected in on-site ground water;
- MTBE has been detected in downgradient off-site ground water; and
- TPHg has been detected in downgradient off-site ground water.

Substantial volumes of petroleum products have been recovered from the Thrifty No. 247 and Unocal 2726 in the Sepulveda/Palms area, and from the Shell station in the Sepulveda/Venice area. Further details of the characterization of the 11 sites presented in this chapter are provided in Section 6.1.

1.1.1 MTBE Contamination at the COSM Well Field

As noted above, some 19 wells have been operated at different time frames at the COSM Well Field, but only five were active during the last decade. A summary of MTBE contamination at those five wells is presented on Figure 1-4. All of the wells were shut down in June of 1996.

1.1.2 MTBE Contamination at the SCWC Well Field

At SCWC Well Field, of the three wells that were active during the last decade, MTBE was not detected at SCWC-9 and SCWC-10. SCWC-8 was abandoned prior to 1990 and no MTBE record is available for that well.

1.2 Geographic Definitions

The following geographical definitions will be used in this SWAR Report.

Charnock Sub-Basin:	The area of Los Angeles and Culver City bound by the Overland Fault to the east, the Ballona Escarpment to the south, the Charnock Fault to the west, and the base of the Santa Monica Mountains to the north.
Capture Zone:	The area within the associated aquifer from which the COSM and SCWC production wells draw ground water.
Well Fields:	COSM and SCWC Well Fields.
Well Field Vicinity:	An approximate one mile (1.6 km) radius beyond the Well Fields.